# ICHNEUMONOIDEA (HYMENOPTERA) FROM THE LOWER CRETACEOUS OF MONGOLIA

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The hymenopterous superfamily Ichneumonoidea is known paleontologically from the Neocomian, a lower part of the Lower Cretaceous, and all the oldest representatives described belong to the Ichneumonidae (Townes 1973; Rasnitsyn 1975). Two new fossil ichneumonoids were collected by the Paleoentomological Party (Dr. A. G. Ponomarenko, Head) of the Joint Soviet-Mongolian Paleontological Expedition. They are probably older than those mentioned above. They were found at Khutel-Khara-Ula (known also as Khara-Khutul-Ula) Mts., 70 km SW of Sain-Shand, East Gobi Dsitrict of Mongolia, in a lens of silstone and mudstone enclosed in basalts dated radiologically as Lower Cretaceous (Shuvalov 1979). Paleoentomological data indicate an age older than that of all previously known Lower Cretaceous insect assemblages, because the majority of the insects in Khutel-Khara is typical for the Neocomian fauna as it is described by Zherichin (1978) and Rohdendorf and Rasnitsyn (1980), while a few groups (e.g., limnic stoneflies and hemipterous family Progonocimicidae) are absent or rare since Jurassic. The Ichneumonoidea from Khutel-Khara are described below. The types are deposited in the Paleontological Institute, Academy of Sciences of the USSR, Moscow.

## PRAEICHNEUMONIDAE, new family

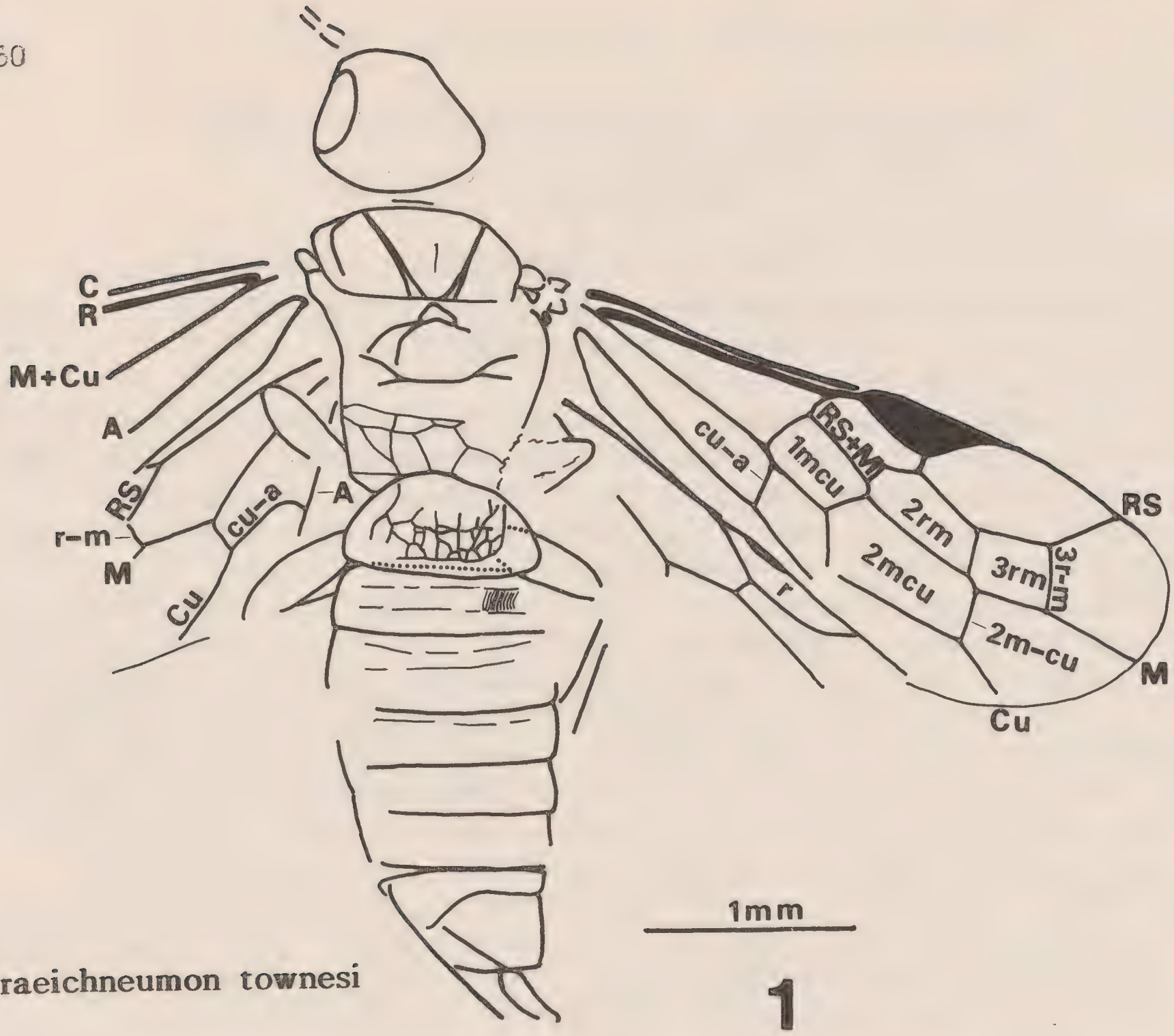
Figure 1

Fore wing with costal space narrow but distinct, RS+M, 2-3r-m and 2m-cu equally well developed, cells 2-3rm large, not modified. Hind wing with cell r closed, short, r-m short, distant from both RS and M bases. Mesoscutum with median suture much reduced while parapsides (notaulices) strong. Metasoma with tergum I broad, terga I-III overlapping.

Type and the only genus *Praeichneumon*, n. gen.

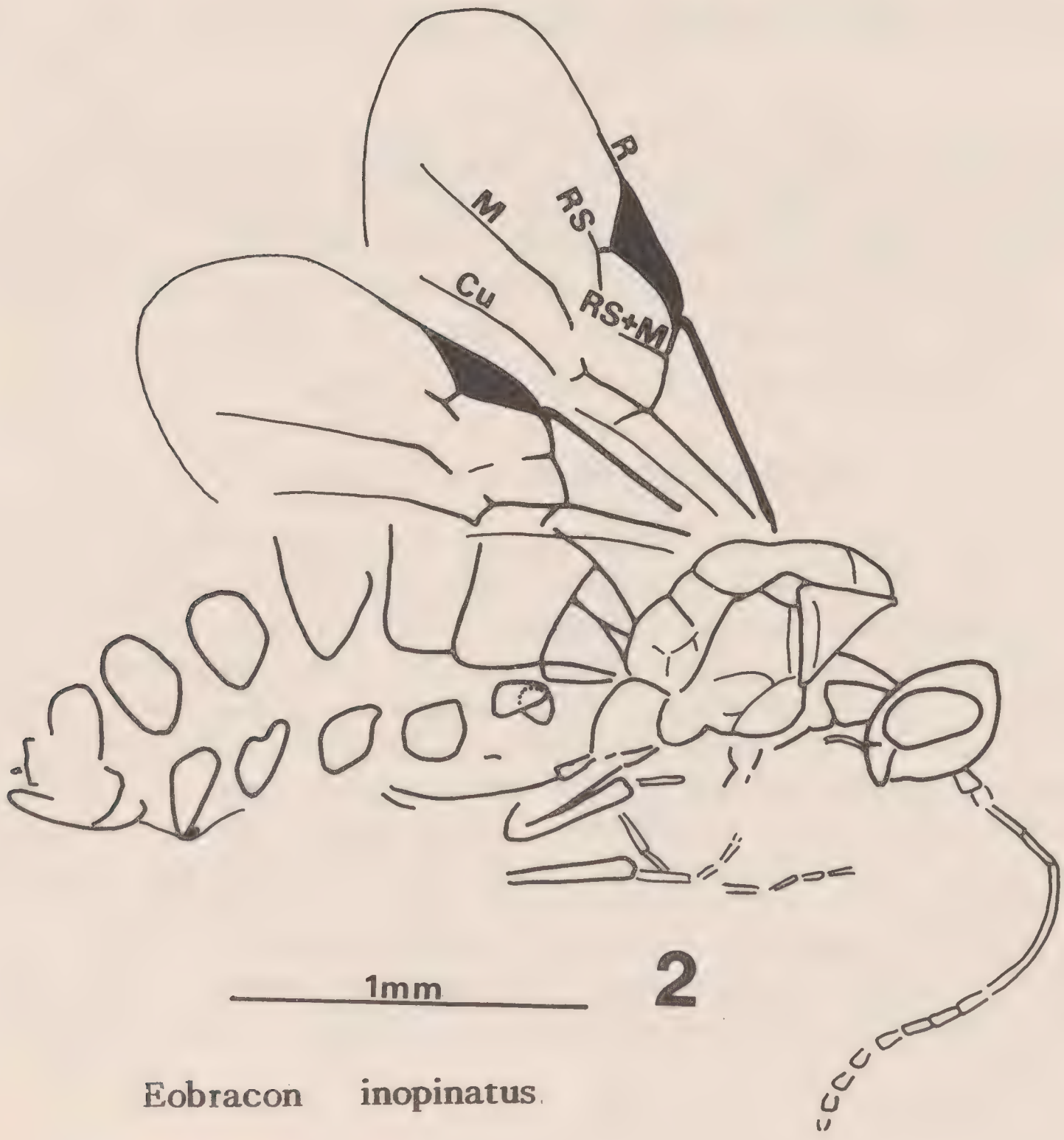
## **PRAEICHNEUMON**, new genus

Habitus stout. Size small. Head transverse, eyes moderately large, temples weak. Pronotum short centrally. Mesonotum transverse with parapsides complete, deep, narrow cephalad, broad caudad, separated posteromedially. Median line very thin, reaching neither fore mesonotal margin nor transverse suture. Transverse suture thin, complete. Prescutellar fovea in form of an inverted V. Scutellum transverse with sides subparallel. Propodeum possibly areolated in the typical Ichneumonid type. Its hind slope obscured in the fossil. Wings as figured. Legs short. Metasomal tergite I transverse, scarcely narrower than the following, thickened and rugose except laterally and apically. Terites II-VI transversely depressed basally or (at least tergites II-III) subbasally, depression being strongest in tergite II and weakest in VI. Ovipositor sheath short, narrowed apically, convex ventrally, scarcely concave dorsally, rounded apically. Ovipositor straight (apex missing in fossil).




Praeichneumon townesi

1




2

Eobracon inopinatus


FIGS. 3 – 4. **Praeichneumon townesi, photos**
3, in polarized light. 4, in normal oblique light

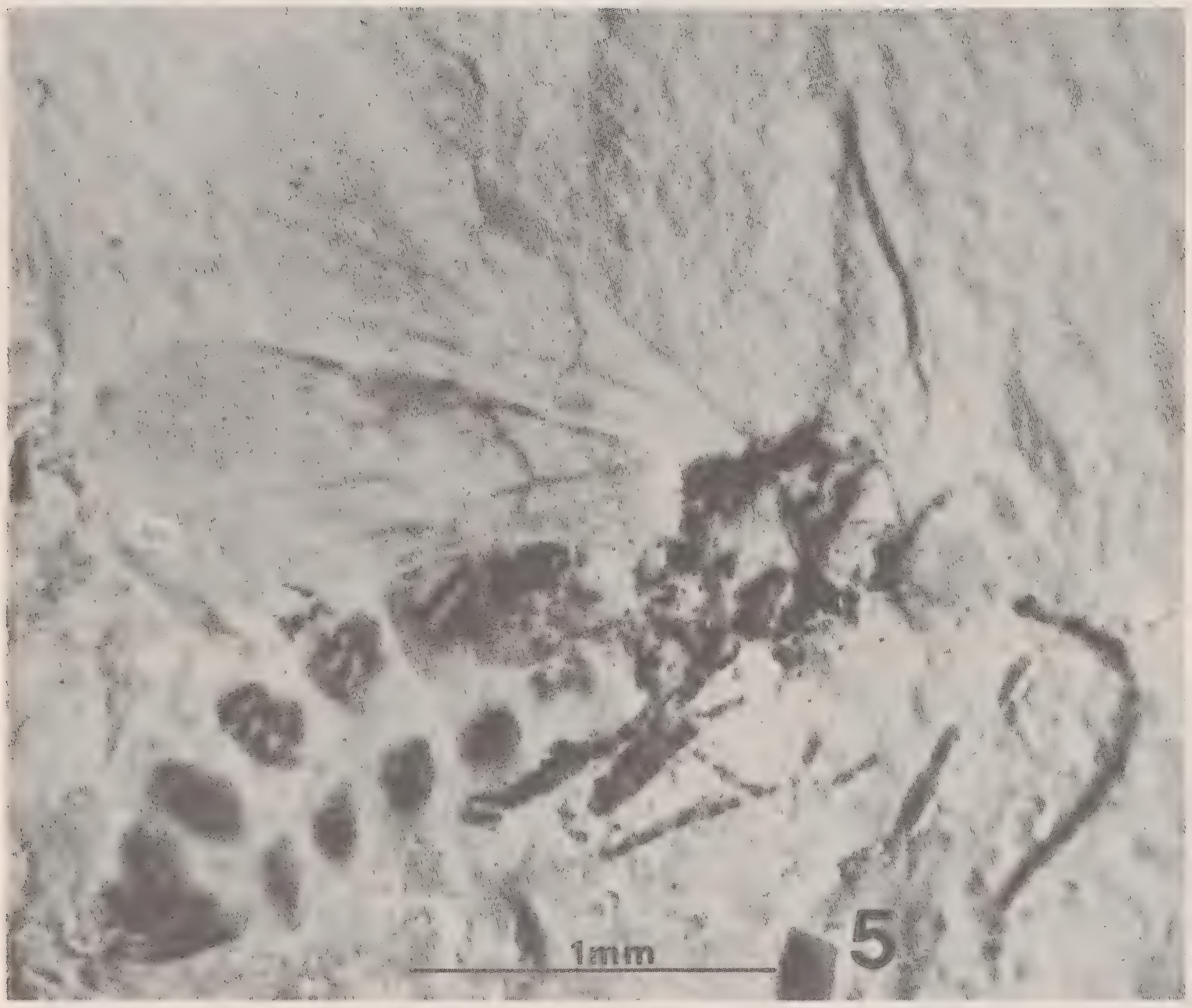



FIG. 5. Eobracon inopinatus
Photograph in polarized light.

The type and only species, *P. townesi* , n. sp.

The generic name is from *Ichneumon*. Gender masculine.

**Praeichneumon townesi**, n. sp. (Figs. 1, 3, 4)

*Female*: Macrosculpture not mentioned above absent. Less coarse sculpture discernible only in transverse subbasal depression on tergite II in the form of fine longitudinal striation.. Head and thorax dark. Hind femur except apex, metasomal tergite I and apices of tergites II-V less dark. Middle femur except apex, rest of tergites II-V and tergite VI still less dark. Veins, pterostigma, middle and hind tibiae and femoral apices, tergite VII and ovipositor sheath rather light. Wing membrane and tergite VIII light.

*Length*: Body 5.0 mm. Thorax 1.3 mm. Hind femur 0.7 mm. Fore wing 3.2 mm. Ovipositor sheath 0.25 mm.

*Holotype*: Female, no. 3965/416, Khutel-Khara-Ula Mts., SE Mongolia, locality 300-1, Lower Cretaceous (Moscow).

The species is named in honor of Dr. Henry Townes.

*Position and affinities*: *Praeichneumon* is included in Ichneumonoidea because it has autapomorphies of the superfamily (costal space reduced) and of the infraorder Ichneumonomorpha (median mesonotal suture reduced and first abscissa of M straight in hind wing) and lacks apomorphies of other ichneumonomorph superfamilies (for details see Rasnitsyn 1980). A new family is erected for this fossil because of the presence of important autplesiomorphies (3rm cell closed in fore wing, r cell closed and short and short in hind wing) and the absence of the apomorphies of other ichneumonoid families. The family is treated as lacking apomorphies, supposing those seen in the fossil (short oviposition, narrow temples, fore wing without interanal cross-veins, hind wing with cu-a long, sinuate) to be features of the genus and not the family. Thus Praeichneumonidae is a paraphyletic unit ancestral to all other Ichneumonoidea (I would not consider paraphyletic taxa as unnatural ones, see for details Rasnitsyn, 1980: 6-7).

## BRACONIDAE

### **EOBRACON**, new genus

Figure 2

Habitus neither stout nor slender. Size small. Head of moderate size. Eye large, reaching mandibular base. Temple narrow. Mandible not protruding indicating absence of clypeal fovea. Palpi long. Antenna filiform with about 16 joints, scape a little longer than pedicel, both of subequal width and combining of subequal length to first flagellomere. Thorax short and high. Pronotum with vertical depression subparallel to its hind margin laterally. Mesonotum with distinct parapsids. Scutellum long. Mesopleura with prepectal carina and subventral horizontal depression joining prepectal carina and sharply margined above. Apical slope of metanotum, rather long. Propodeum small. Legs thin, of moderate length. Fore wing with R complete (not fractured before RS base). Pterostigma large, long, with r-rs far beyond middle. Basal vein with RS occupying 0.4 its length. Veins adjacent to

bifurcation point of RS+M much reduced. R beyond pterostigma and RS beyong r-rs veru sjprt/ 2-3r-m absent. M and Cu almost reaching wing margin. M bent basally indicating former position of 2r-m. 1m-cu much reduced apically, its direction meeting M submedially between supposed RS+M apex and former 2r-m position. Crossvein cu-a postfurcal. Brachial cell issuing Cu below its midhight, not clearly closed below it. Interanal crossvein rudiments absent. Hind wing not preserved in fossil. Metasomal terga transverse, tergites I III, unlike the following, not separable when macerated and evidently not overlapping. Tergite I with deep medial furrow forking basad. Only laterotergite I present. Sternite I not seen in the fossil, sternal halves II-VI separated (not completely so in sternite VI), small III-IV largest, II least, VI longest), subquadrate to subtriangular, with medioapical and/or laterobasal angles most prominent. Ovipositor short, scarcely upcurved, sheath rather wide, rounded apically.

Type and the only species, *E. inopinatus*, n. sp.

The genus name is from EWS (dawn), plus *Bracon*.

**Eobracon inopinatus**, n. sp. (Figs. 2, 5)

*Female*: Antenna distinctly widened subapically. Scape subconical. Pedicel subquadrate. Flagellomeres elongate (basal one with length ca. 4 times apical width, penultimate hardly 1.5 times width), smoothly jointed basally and centrally, weakly moniliform apically. Sculpture weak or absent (not discernable in fossil). Head, antenna, thorax and coxae dark, legs and metasomal sclerites less dark, veins and pterostigma rather light.

*Length*: Body as preserved (with metasoma swollen due to maceration) 2.8 mm. (In lifetime probably 2.3-2.4 mm). Antenna 1.6 mm. Thorax 0.75 mm. Hind trochanter and femur combined 0.62 mm. Fore wing 1.8 mm. Ovipositor 0.55 mm.

*Holotype*: Female, no. 3965/17, Khutel-Khara-Ula, SE Mongolia, locality 300/1, Lower Cretaceous (Moscow).

The species name means unexpected.

*Position and affinities*: *Eobracon* is included in the Braconidae because of the presence of the typical Braconid synapomorphies [Tergites II-III hinged to each other and not telescopic (overlapping), cross-vein in 2m-cu absent in fore wing] while the apomorphies of other ichneumonoids are absent. The affinities of the new genus within Braconidae are not clear, because many important features are not visible in fossil, while those which are visible do not indicate affinities with certain Braconid subgroups. Some characters seem to be unique for *Eobracon*, e.g., R and RS much shortened unlike M and Cu, R not fractured before base of RS, hind wing with reduced venation, and tergite I furrowed medially. One featue (cross-vein 1m-cu far postfurcal in wing with venation reduced and RS+M leaving basal vein subcentrally and thus subhorizontal) is known to me elsewhere only for atypical Neoneurini described by Tobias and Yuldashev (1979), but otherwise those insects differ much from *Eobracon*. I suppose that the latter represents an early aberrant branch of the Braconidae. The presence of such advanced form in the lowermost Lower Cretaceous is really unexpected, because other cretaceous Braconidae are much younger and less advanced (Rasnitsyn 1975, 1980).

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